DOCUMENT RESUME

ED 168 906 SE 027 567

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TITLE The Effects of the New Jersey Hunter Education Program and Selected Demographic Variables of Students on Knowledge and Attitude Scores About the Sport of Hunting. Final Research Report.
SPONS AGENCY Fish and Wildlife Service (Dept. of Interior), Washington, D.C.; New Jersey State Dept. of Environmental Protection, Trenton.
BUREAU NO W-50-S
PUB DATE Jun 78
NOTE 69p.; Contains occasional light type

EDRS PRICE MF01/PC03 Plus Postage.
DESCRIPTORS *Accident Prevention; Attitudes; Educational Research; *Environmental Education; *Outdoor Education; *Recreation; *Safety; Wildlife Management
IDENTIFIERS *Hunter Education

ABSTRACT

In order to assess the effect of a hunter education program on knowledge and attitudes toward hunting, students enrolled in the eight-hour New Jersey Hunter Education Course were administered the New Jersey Hunter Education Examination Number 4 and the Attitude Inventory for Hunters as a pretest and posttest. The hunter education course is required of all persons being issued a first hunting license. Eleven hunter education classes from eleven New Jersey countries participated in the study. The results were structured around the categories of demography, knowledge about hunting, attitudes about hunting, and correlations between knowledge and attitude scores. The findings were related to such variables as classes, age, sex, previous hunting licenses, hunters in the home, and magazines received. There was a significant correlation between both pretest and posttest knowledge and attitude scores. (BB)

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THE EFFECTS OF THE NEW JERSEY HUNTER EDUCATION PROGRAM AND SELECTED DEMOGRAPHIC VARIABLES OF STUDENTS ON KNOWLEDGE AND ATTITUDE SCORES ABOUT THE SPORT OF HUNTING

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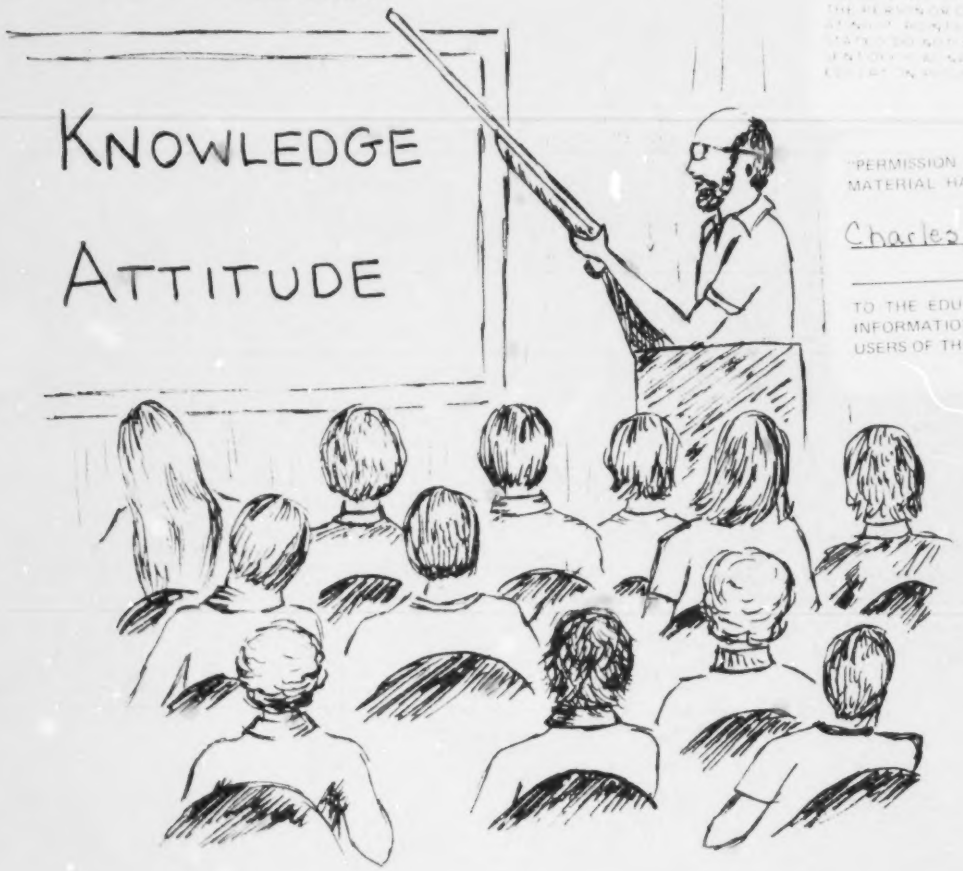

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Division of Fish, Game and Shell Fisheries
N.J. Department of Environmental Protection
In Cooperation With
U.S. Fish and Wildlife Service

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Final Research Report

THE EFFECTS OF THE NEW JERSEY HUNTER EDUCATION PROGRAM AND SELECTED DEMOGRAPHIC VARIABLES OF STUDENTS ON KNOWLEDGE AND ATTITUDE SCORES ABOUT THE SPORT OF HUNTING

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Funded and Supported by

Division of Fish, Game and Shell Fisheries
N.J. Department of Environmental Protection

In Cooperation With

U.S. Fish and Wildlife Service
under
Pittman-Robertson Federal Aid Project W-50-S

June, 1978

ACKNOWLEDGMENTS

The researchers are grateful to Mr. Russell A. Cookingham, Director, Division of Fish, Game, and Shell Fisheries for the encouragement to do the study and financial support made available for funding the research project.

Sincere appreciation is extended to Lt. William D. Nevins, State Hunter Education Coordinator; Lt. Robert J. Burns, Northern District Hunter Education Coordinator; and Lt. Marco S. Busnardo, Southern District Hunter Education Coordinator for advice and guidance in setting up the research study and help in scheduling classes for the purpose of gathering data.

Appreciation is also extended to Dr. J. Richard Trout, Statistician, Cook College, Rutgers University, for most able assistance in processing and interpreting the data.

The instructional teams at each and every training center were, indeed, very cooperative and accommodated to the needs of the research project in every way. Students in the hunter education program, with very few exceptions, volunteered to provide the data requested. Appreciation is extended to both groups who gave so freely of their time.

Thanks to each of you for helping to make the study and final report a reality.

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INTRODUCTION

The State of New Jersey has some 20,000 or more persons who annually wish to purchase a hunting license for the first time. Prior to being issued a first hunting license, a New Jersey resident must submit to an eight-hour Hunter Education Course provided by the Division of Fish, Game and Shell Fisheries through the coordination of some 600 volunteer instructors. Such topics as history and tradition of hunting, gun handling and safety, hunter ethics and responsibility, conservation of wildlife, and game laws are reviewed and discussed. Students also receive field experience in the handling and use of firearms. The course helps the new hunter gain a minimal understanding of and wholesome attitude toward the sport of hunting.

Need for the Study

Personnel from the Division of Fish, Game and Shell Fisheries and Rutgers University worked closely together during the past two years on a series of seminars which provided the volunteer instructors of the State with subject matter organization and approaches to teaching the Hunter Education Course. The seminars were generally held at Rutgers University one night per month for approximately 60 instructors per seminar. All instructors were invited to attend at least two training seminars.

A second cooperative project was undertaken during early 1977 to assess and revise the Hunter Safety and Conservation Program Student Examination Number 3. Validity was assessed relative

to the correlation of content in the NRA Hunter Safety and Conservation Program, used as a basic reference for teaching the hunter education courses, and the test items in Student Examination Number 3. The item analysis and validity study, discussed more thoroughly in the design of the study, resulted in New Jersey Hunter Education Examination Number 4. (See Appendix A)

Hopefully, as a result of the two cooperative projects, both hunter education instruction and testing were improved. Logically, the next step was to do an assessment of the Hunter Education Program and gather data needed for planning additional projects for the purpose of promoting instructor training and the New Jersey Hunter Education Program.

General Objective of the Study

The overall objective of the study was to evaluate the effects of the New Jersey Hunter Education Program and selected demographic variables of students on knowledge and attitude scores about the sport of hunting.

DESIGN OF THE STUDY

This part of the study deals with the hypotheses, the sample, instruments used to gather data, and procedures used to treat the data.

Specific Objectives

The specific objectives of the study were written in the form of null hypotheses to be tested statistically. The hypotheses were:

1. There will be no significant difference in mean pretest knowledge scores of participants among the county classes or schools.
2. There will be no significant difference in mean knowledge scores from pretest to post-test of participants among county classes or schools.
3. There will be no significant change in mean knowledge scores from pretest to post-test among three age groups of participants.
4. There will be no significant difference in mean pre-attitude scores of participants among the county classes or schools.
5. There will be no significant difference in mean attitude scores from pre-attitude to post-attitude among the participants of county classes or schools.
6. There will be no significant change in mean scores from pre-attitude to post-attitude among three age groups of participants.

7. There will be no significant correlation between mean pretest knowledge scores and mean pre-attitude scores.
8. There will be no significant correlation between mean post-test knowledge scores and mean post-attitude scores.
9. There will be no significant correlation between change in mean knowledge scores from pretest to post-test and change in mean attitude scores from pre-attitude to post-attitude.

In addition to the null hypotheses tested, data were collected on the variables of (1) sex, (2) hunting licenses held, (3) number of hunters in the home, and (4) number of wildlife magazines received in the home. These data were tested statistically in terms of mean knowledge and attitude inventory scores.

The Sample

The guidelines written into the proposal for selecting the sample for the study were as follows: Beginning September 1, 1977, ten classes of hunter education students were to be selected to participate in the research project on a voluntary basis. In order for the sample to be fairly representative of the State of New Jersey, no more than one class was to be selected from a county. Each class was to consist of at least 20 students at the start and preferably more to compensate for attrition. A total sample of 200 or more students in 10 classes from 10 counties

in the State of New Jersey was to constitute the experimental sample of the study.

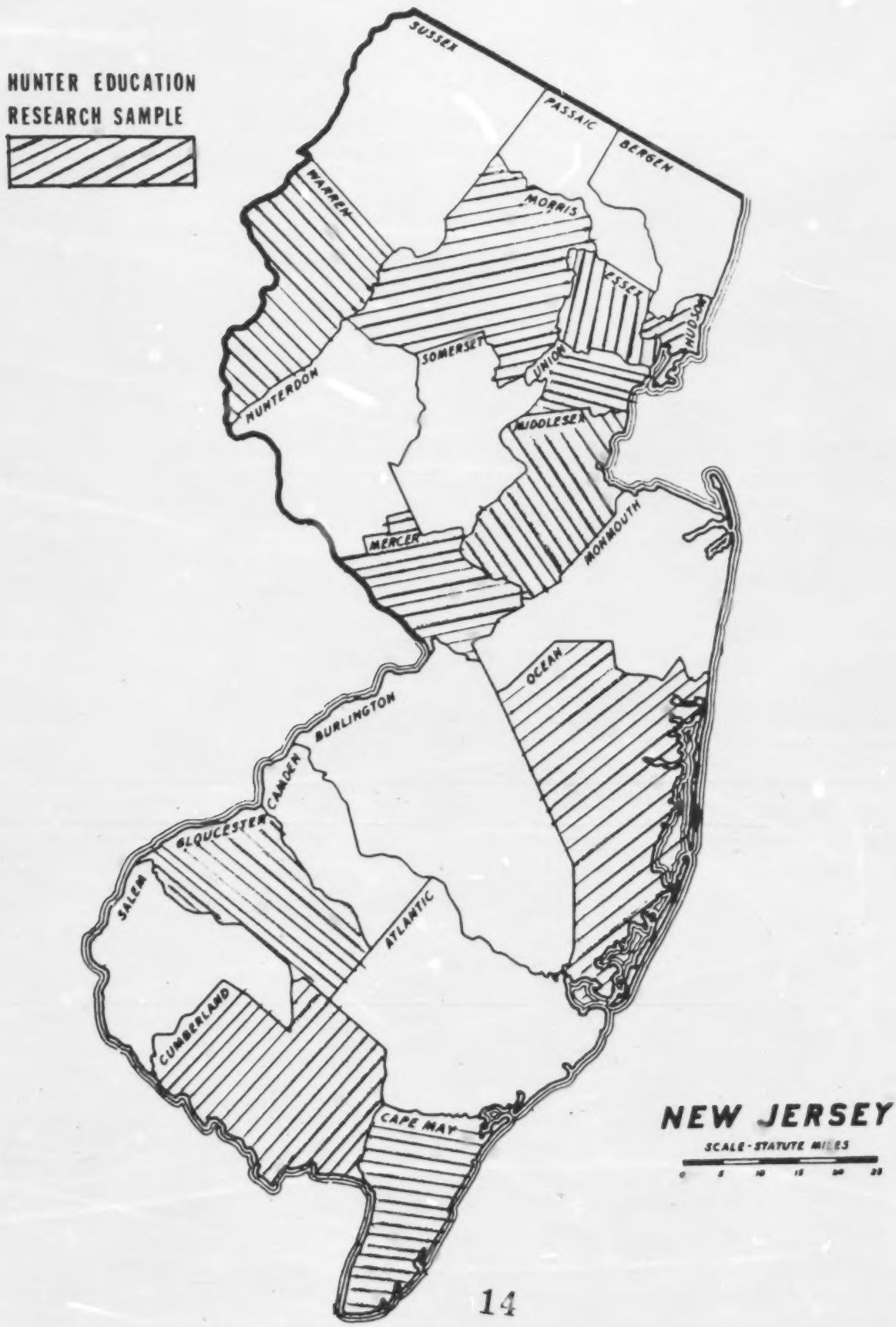
The sample actually consisted of twelve classes for several reasons: (1) three classes were actually smaller than the 20 students requested, (2) one class was a repeat in a county with a previous small class, (3) one class did not complete both the pre- and post-knowledge test, and (4) one class did not complete both the pre- and post-attitude inventory.

In summary, eleven county classes or schools did participate in the research study. (See map on next page for Hunter Education Research Sample.) Both urban and rural counties were sampled and the participation, while not random, was assumed to be representative of the Hunter Education program in the State.

A total of 297 participants completed all of the data for the research project; 34 completed only the knowledge and demographic data, and 16 completed only the attitude and demographic data.

New Jersey Hunter Education Examination Number 4

Residents of New Jersey who desire to purchase their first hunting license must complete an eight-hour course in hunter education and pass an examination at the end of the course. The paper and pencil test used at the end of course work during the Fall of 1977 was entitled, New Jersey Hunter Education Examination Number 4. It was also the instrument used to gather knowledge data for this research study.


HUNTER EDUCATION
RESEARCH SAMPLE
SUSSEX
PASSAIC
BERGEN
WARREN
MORRIS
ESSEX
HUDSON
SOMERSET
UNION
HUNTERDON
MIDDLESEX
MERCER
MONMOUTH
OCEAN
BURLINGTON
CAMDEN
GLOUCESTER
SALEM
ATLANTIC
CUMBERLAND
CAPE MAY
NEW JERSEY
SCALE - STATUTE MILES

New Jersey Hunter Education Examination Number 4, a copy of which is in Appendix A, is a refinement of Hunter Safety and Conservation Program Student Examination Number 3. Content validity of the examination was reviewed in terms of the NRA Hunter Safety and Conservation Program manual used as the basic reference for the hunter education course. An item analysis of the examination questions was based on examination scores of 611 students instructed in 15 classes throughout the State of New Jersey during the Fall, 1976.

Validity. A commonly used definition of validity is that it is the degree to which a test measures what it purports to measure--or does the job it is supposed to do. Content validity is the degree to which the test items represent the content (hunter education) that the test was designed to measure. A related type of content validity is called sampling validity, or the degree to which the test serves as an adequate sample of the total universe of content one wants to measure.

Content validity was assessed by means of content in the NRA Hunter Safety and Conservation Program manual and the items selected and rewritten for New Jersey Hunter Education Examination Number 4. Following is a list of the subject matter areas in the NRA Manual and the questions in Examination Number 4 which relate to the subject matter areas:

Subject Matter Areas	Questions in the Exam
History, hunter tradition and hunter ethics	9, 12, 21, 22, 29, 34
Facts about wildlife, protection of game, and value of hunting	13, 25, 32, 33, 36, 40
Courtesy, sportsmanship, marksmanship, game laws and identification	5, 16, 19, 23, 31, 39
The hunter and safety, firearm safety, safety rules	7, 11, 18, 20
Firearms, ammunition, parts, sights, safties	1, 3, 6, 8, 14, 38
Rifle shooting, shotgun shooting, and handgun shooting	2, 24, 26, 30, 37
Safe gun handling, cleaning, and storing	4, 17, 27, 28, 35
Survival, rescue signals, etc.	10, 15

Some questions may fit into more than one of the subject matter areas. And, too, other individuals may categorize a few of the questions differently than was done above. However, the array of questions in each area of subject matter is indicative of the fact that the New Jersey Hunter Education Examination is not without content validity.

Item Analysis. For purposes of this assessment an a priori decision was made to establish mastery of knowledge at 80 percent as measured by the Examination. Eighty percent or more on the examination was considered as mastery of the subject matter in the NRA manual.

Each of the 55 items in the Hunter Safety and Conservation Program Student Examination Number 3 was assessed in terms of 611 student responses in 15 Hunter Education Classes. When responses to an item were less than 80 percent correct, the item was reviewed for ambiguities, reading level, faulty construction, etc. Fifteen, or 27 percent, of the items in the Examination received less than 80 percent correct answers. The content validity study and item analysis of the Examination resulted in the New Jersey Hunter Education Examination Number 4.

Attitude Inventory for Hunters

The Attitude Inventory for Hunters was developed and tested by Dr. Frank Anthony (1964), The Pennsylvania State University. It was used as a yardstick to measure the effectiveness of teaching methods in hunter safety education.

"In constructing the Attitude Inventory for firearm and hunting safety education, four or five situations for each of the 'Ten Commandments of Shooting Safety' were chosen and formulated into an inventory of personal adjustment and emotional concepts. The items on the inventory comprised reactions to proper use of firearms, respect for fellow hunters, and respect for property rights and game laws." (Appendix B - Attitude Inventory for Hunters)

"An Attitude Inventory of 60 items was validated by 50 Game Protectors who acted as judges to evaluate each item. From this procedure 50 items were selected and tested further in two schools. . . After a few changes the test was printed with the

title, An Attitude Inventory for Beginning Hunters." (Appendix B - Attitude Inventory for Hunters) The Attitude Inventory for Hunters was used to gather data for this study.

Demographic Data

In addition to the two instruments, New Jersey Hunter Education Examination Number 4 and Attitude Inventory for Hunters, a questionnaire was prepared and administered to gather additional information about the participants in the hunter education course. (Appendix C - Hunter Education Research Questionnaire) Seven kinds of information were solicited: (1) age; (2) sex; (3) juvenile license held; (4) regular hunting license held; (5) number of wildlife magazines received in home; (6) number of hunters in home; and (7) appeal of hunting to participants. The instrument was administered to participants at the beginning of the first class on hunter education.

Gathering the Data

The State Hunter Education Coordinator notified the researchers when and where classes were being formalized during the fall season, 1977. The researchers were forced to select those hunter education classes to gather data which did not conflict with University teaching or other previous commitments made. At the request of the researchers, the State Hunter Education Coordinator informed the County Supervisor that the researchers asked permission to collect data prior to and immediately after hunter education instruction. The County Supervisors granted permission to collect

data in every case and made every effort to accommodate to the researchers' needs.

The researchers or a Hunter Education Coordinator attended the first class of the several scheduled to teach the eight-hour course. The purpose was to administer the pre-instructional instruments which included (1) New Jersey Hunter Education Examination Number 4, (2) Attitude Inventory for Hunters, and (3) Hunter Education Research Questionnaire. Prior to administering the instruments, the significance of the research study was reviewed and cooperation was requested from each participant in class. It was made clear in the class meeting (public assembly) that (1) providing the data was strictly voluntary, (2) anonymity was promised and guaranteed, (3) there were no known risks in completing the instruments, and (4) the participants were free to withdraw from the research study at any time. This understanding relative to the infringement on human rights was generally accepted by the participants in that nearly all supported the research by providing the information requested.

After the pre-instructional information was gathered by the researchers, the county instructional team proceded to teach the course on hunter education. The eight hours of instruction were based on the NRA Hunter Safety and Education Program (1973), but included other instructional resources which varied from county to county. Usually the eight hours of instruction were divided into three equal sessions which were offered one night per week over a three-week period. On occasion the eight hours

of instruction could have been given in two successive nights. The instructional team in each county was given some latitude in its approach to teaching, emphasis on subject matter, and scheduling of classes. The instructional teams, without exception, were dedicated to training students and the sport of hunting.

At the end of each hunter education course, the researchers or a Hunter Education Coordinator administered the New Jersey Hunter Education Examination Number 4 and the Attitude Inventory for Hunters. The participants were not aware that the two instruments would be administered the second time. The Examination was generally scored immediately and the scores were used by the instructional team to issue entitlement papers for New Jersey hunting license or to withhold them.

Treatment of the Data

All completed instruments by participants were scored or rescored at Rutgers University. Data for each participant were punched on IBM cards. The data were analyzed by computer at the Center for Computer and Information Services, Rutgers University.

Differences among means were analyzed statistically by analysis of variance for hypotheses 1 through 6 and the unhypothesized demographic variables. When significance was found among means, a hand calculated procedure known as "least significant difference" was done to determine significance between pairs of variables. The paired t-test was computed between mean pretest and post-test scores for selected single variables.

Hypotheses 7 through 9 were treated statistically by correlating pre-attitude with pretest scores, post-attitude with post-test scores, and difference in attitude with difference in test scores.

For the variable "hunting licenses held", the categories of (1) juvenile license, (2) regular hunting license, and (3) both juvenile and regular hunting licenses were combined. In this way the newly formed "license category" was large enough to compare with the non-licensed group. Using the license and non-license categories, a second statistical analysis was computed for both the knowledge scores and the attitude scores.

PRESENTATION AND DISCUSSION OF DATA

The data are presented and discussed in terms of the null hypotheses formulated and also the demographic variables suspected to be influential in the study. The section includes knowledge, attitudes, and correlation of the two variables. This part of the report is concluded with reasons given by the participants for wanting to pursue the sport of hunting.

Knowledge Scores

The highest possible knowledge score that a participant could make was 40.00, which was the number of questions in the New Jersey Hunter Education Examination Number 4.

Hypothesis 1. There will be no significant difference in mean pretest knowledge scores of participants among the county classes or schools.

The highest mean pretest score made by a beginning class or school was 30.22 while the lowest was 25.29 as shown in Table 1. A spread of 4.93 points or 12.33 percent existed between the highest and lowest mean pretest knowledge scores.

Mean pretest knowledge scores of participants among the county classes or schools were significantly different statistically. Some beginning classes were more knowledgeable than others about the sport of hunting. Therefore, the null hypothesis was rejected.

Differences in pretest mean knowledge scores for such variables as geographical locations within the State and population density of the counties were not calculated. A close examination

of the data did indicate that the differences were not likely to be significant.

The data in Table 1 reveal that the classes begun the eight hours of courswork at different levels. The findings should prompt instructors to discover the level at which to begin teaching for best results. If the instruction is too elementary, the class will lose interest in the subject; if too advanced, the students will not be able to comprehend. A good instructor will determine the level of instruction that best meets the needs of the entire class.

Hypothesis 2. There will be no significant difference in mean knowledge scores from pretest to post-test of participants among county classes or schools.

Table 1 shows that the difference in mean knowledge scores from pretest to post-test for each county class or school was statistically significant at the .01 level. Gains in scores from 3.54 to 7.08 or 8.85 to 17.70 percent were made primarily as a result of the hunter education course. A post-test score of 32.00 meant that 80 percent of the questions were answered correctly. Nine of the eleven classes produced mean scores of higher than 80 percent correct which demonstrates the mastery of the subject by the students. The highest mean post-test score of 35.11 meant that nearly 88 percent of the questions in the examination were answered correctly by all the members of the class. Producing significant differences in scores between the pretests and post-tests when the pretests are high is more difficult than when they are low. Putting it another way, students who make low pretest

Table 1. Mean Pretest and Post-test Knowledge Scores With Differences for 331 Participants in 11 County Hunter Education Classes

County Class or School (1)	Number of Participants	Mean Knowledge Scores		
		Pretest (2)**	Post-test	Difference (3)**
1	9	30.22	35.11	4.89**
3	46	26.85	31.48	4.63**
4	35	28.91	34.34	5.43**
5	34	25.29	29.47	4.18**
6	10	25.70	30.40	4.70**
7	24	26.92	32.75	5.83**
8	62	29.06	34.32	5.26**
9	30	27.50	33.43	5.93**
10	26	26.73	33.81	7.08**
11	35	29.34	32.88	3.54**
12	20	27.75	34.30	6.55**

(1) County class or school #2 did not complete the knowledge test but did complete the attitude inventory.

(2) Mean pretest knowledge scores among county classes or schools were significantly different statistically at the .01 level by analysis of variance. $F=2.60$ $d.f._{10,320}$.

(3) Mean differences in knowledge scores among county classes or schools were significantly different statistically at the .01 level by analysis of variance. $F=2.21$ $d.f._{10,320}$.

For each of the schools there was a significant gain in knowledge scores from pretest to post-test at the .01 level by paired t-test. 1. $t=3.91$, 3. $t=8.42$, 4. $t=8.62$, 5. $t=6.63$, 6. $t=3.98$, 7. $t=7.76$, 8. $t=11.19$, 9. $t=8.72$, 10. $t=9.70$, 11. $t=5.62$, 12. $t=7.89$.

scores have more to learn and further to go to reach the ceiling on the post-test.

There was a significant difference in mean knowledge scores from pretest to post-test for each school of class. Likewise, some of the differences were significantly higher than those from other schools. Therefore, null hypothesis 2 was rejected.

Hypothesis 3. There will be no significant change in mean knowledge scores from pretest to post-test among three age groups of participants.

Table 2 reveals that the participants 12 years or less had pretest scores of 25.05 while the older participants did much better. In fact, the pretest knowledge scores of the older age group were nearly as high as the post-test scores of the younger age group.

Each of the three age groups had significantly higher post-test scores than pretest scores. While the youngest age group showed a slightly higher gain in knowledge as a result of the eight hours of instruction, its mean post-test scores were nearly 10 percent behind the older age group.

Maturation evidenced itself as a factor in both the pretest and post-test knowledge scores. Reading ability and comprehension may have favored the older age groups. Certainly, life experience was on the side of the older age group and transfer or application of learning may have accounted somewhat for the higher scores.

Sex variable. Knowledge test scores with differences for males and females are recorded in Table 3. The pretest scores

Table 2. Mean Pretest and Post-test Knowledge Scores With Differences for 331 Participants in Three Age Groups

Age Groups (Years)	Number of Participants	Mean Knowledge Scores		
		Pretest (1)**	Post-test	Differences (2)n.s.
12 or Less	83	25.05	30.71	5.66**
13 thru 21	168	27.95	33.26	5.31**
22 or More	80	30.14	34.60	4.46**

(1) Mean pretest knowledge scores among the three age groups were significantly different statistically at the .01 level by analysis of variance. $F=24.03$ $d.f._{2,328}$.

The mean pretest knowledge score for age group (12 or Less) was significantly lower statistically than those for the other two age groups at the .05 level by least significant difference.

The mean pretest knowledge score for age group (22 or More) was significantly higher statistically than those of the other two age groups at the .05 level by least significant difference.

(2) Mean differences in knowledge scores among the three age groups were not significantly different statistically by analysis of variance. $F=2.23$ $d.f._{2,328}$.

For each of the three age groups the mean difference in knowledge scores from pretest to post-test was statistically significant at the .01 level by paired t-test. Age 12 or less, $t=13.48$; age 13-21, $t=18.31$; and age 22 and over, $t=10.92$.

Table 3. Mean Pretest and Post-test Knowledge Scores With Differences for 331 Participants by Sex

Sex	Number of Participants	Mean Knowledge Scores		
		Pretest (1)n.s.	Post-test	Difference (2)n.s.
Male	310	27.73	32.87	5.14**
Female	21	28.14	34.14	6.00**

(1) Mean pretest knowledge scores between males and females were not significantly different statistically by analysis of variance. $F=0.13$ $d.f._{1,329}$.

(2) Mean differences in knowledge scores from pretest to post-test for both males and females were not significantly different statistically by analysis of variance. $F=1.02$ $d.f._{1,329}$.

For both males and females the increase in knowledge score was statistically significant at the .01 level by paired t-test. Males, $t=23.80$; females, $t=7.32$.

of 27.73 and 28.14 for males and females respectively were not significantly different statistically. The increase in knowledge scores from pretest to post-test of 5.14 and 6.00 for males and females were both statistically significant.

While not statistically significant, it is pointed out that females made slightly higher pretest scores than males, and they increased the difference in the post-test scores as a result of the instruction. Note, however, that the sample had in it only 21 females or about 6 percent of the participants. A larger female group may have provided a different kind of data.

License variable. Table 4 shows that only about 11 percent of the participants in the hunter education classes in the study were licensed previously. The previously licensed participants combined had significantly higher pretest scores (31.81) than did the non-licensed participants (27.26). However, the non-licensed participants made significantly better gains in scores from pre-test to post-test (5.45) than did the previously licensed hunters combined (3.06). The participants with previous "regular" license did not show a significant gain in scores from pretest to post-test as a result of the instruction. All other groups did show signif-icant gains in scores from pretest to post-test.

The data show that participants who held licenses previously had more knowledge about the sport of hunting than those who had no license previous to the beginning of the course. It seems logical that requirements for the juvenile or regular license and some hunting experience were factors which increased the pretest

Table 4. Mean Pretest and Post-test Knowledge Scores With Differences for 331 Participants by Kinds of Hunting Licenses Held Previously

Previous Licenses	Number of Participants	Mean Knowledge Scores		
		Pretest (1)**	Post-test	Differences (2)**
Juvenile & Regular	12	32.42	35.25	2.83**
Juvenile Only	21	31.95	35.00	3.05**
Regular Only	3	28.33	32.33	4.00 n.s.
All Combined	36	31.81	34.87	3.06**
None	295	27.26	32.71	5.45**

(1) Mean pretest knowledge scores of the 36 license holders combined were significantly higher statistically than those of the non-license holders. $F = 28.36$ $d.f._{1,329}$. .01 level.

(2) Mean difference (increase) in scores from pretest to post-test was significantly higher at the .01 level for the non-license holders than for the combined group for 36 license holders. Analysis of variance $F = 13.37$ $d.f._{1,329}$.

Because of its small number, the group that held a regular hunting license previously made no significant gain statistically in score from pretest to post-test as a result of the hunter education course. Gain in mean scores from pretest to post-test was statistically significant at the .01 level by paired t-test for all the other groups. Juvenile and regular, $t=2.64$; juvenile only, $t=3.76$; regular only, $t=1.86$; all licensed groups combined, $t=4.93$; and no previous hunting license, $t=24.77$.

scores significantly of licensed participants over those of non-licensed participants in the course. However, a combination of the higher pretest scores, possibly lack of motivation, and other unforseen factors caused the participants with previous licenses to learn significantly less from the course than the non-licensed participants although their scores remained slightly higher following instruction. It is possible that participants with previous licenses were more complacent about the hunter education course than those with no previous license.

Number of hunters in the home. Data relative to number of hunters in the home of the participants in the hunter education classes are recorded in Table 5. Some 72 percent of the participants reported one or more hunters in their homes.

While statistical differences were not found among the pretest scores, the participants without any hunters in the home did somewhat better than those with hunters in the home. Some of the participants with hunters in the home may have been playing a role which they perceived was expected of them while the participants without hunters in the home were stimulated more internally to pursue the sport of hunting.

Differences in the pretest/post-test scores among the five groups were not statistically different. All groups learned equally well in the classes with scores which increased significantly from pretest to post-test. Those participants with hunters in the home did not have a learning advantage over those without hunters in the home.

Table 5. Mean Pretest and Post-test Knowledge Scores With Differences for 331 Participants by the Number of Hunters in the Home

Number of Hunters in the Home	Number of Participants	Mean Knowledge Scores		
		Pretest (1)n.s.	Post-test	Difference (2)n.s.
0	91	28.68	33.69	5.01**
1	151	27.18	32.83	5.65**
2	82	27.83	32.46	4.63**
3	5	27.20	30.80	3.60*
4	2	26.50	32.50	6.00**

(1) Significant differences were not found among the mean pretest scores by analysis of variance. $F = 1.31$ $d.f._{4,326}$.

(2) Significant differences were not found among the gain in scores from pretest to post-test by analysis of variance. $F = 1.30$ $d.f._{4,326}$.

Gain in mean scores from pretest to post-test was statistically significant by paired t-test for each group regardless of the number of hunters in the home. Significance with three hunters in the home was at the .05 level; significance for all others was at the .01 level using the paired t-test. No hunters in the home, t=12.68; 1 hunter, t=18.23; 2 hunters, t=11.16; 3 hunters, t=2.13; and 4 hunters, t=3.17.

Magazines received in the home. Data in Table 6 reveal that a total of 141 participants in the hunter education classes, or nearly 42 percent, did not receive any wildlife magazines in the home. Furthermore, receiving wildlife magazines in the home did not have a significant influence on participants' mean pretest knowledge scores. Likewise, receiving wildlife magazines in the home did not have a statistically significant influence on participants' mean difference in knowledge scores from pretest to post-test. Regardless of whether or not the participants received wildlife magazines in the home, they made similar gains in scores from pretest to post-test. It is surmised that little content in the wildlife magazines is related to the content in the hunter education course. Secondly, it is possible that hunter education information or content in wildlife magazines was not assimilated simply because of lack of need at the time it was read or for other reasons.

Attitude Scores

The highest possible score that a participant could make on the attitude inventory was 250. The inventory was composed of 50 statements. Each statement was scored from 1 to 5 depending upon the opinion given by the participant.

Hypothesis 4. There will be no significant difference in mean pre-attitude scores of participants among the county classes or schools.

The highest mean pre-attitude score made by a beginning class or school was 209.71 while the lowest was 188.10 as recorded in Table 7. A spread of 21.61 points or 8.64 percent

Table 6. Mean Pretest and Post-test Knowledge Scores With Differences for 331 Participants by the Number of Wildlife Magazines Received in the Home

Magazines in Home	Number of Participants	Mean Knowledge Scores		
		Pretest (1)n.s.	Post-test	Difference (2)n.s.
0	141	26.99	32.29	5.30**
1	89	28.11	33.27	5.16**
2	47	28.68	33.79	5.11**
3	29	28.31	34.17	5.86**
4	25	28.36	32.48	4.12**

(1) Mean pretest knowledge scores among categories were not significantly different statistically in terms of number of magazines received in the home. $F = 1.51$ $d.f._{4,326}$.

(2) Mean difference in knowledge scores among categories from pretest to post-test were not significantly different statistically in terms of number of magazines received in the home. $F = 0.76$ $d.f._{4,326}$.

Mean gain in scores from pretest to post-test was statistically significant at the .01 level by paired t-test for each category of magazines received in the home. No magazines in home, t=16.56; 1 magazine, t=12.90; 2 magazines, t=9.29; 3 magazines, t=8.37; and 4 magazines, t=5.47.

existed between the highest and lowest pre-attitude scores of participants. Mean pre-attitude scores among county classes or schools were significantly different statistically. Some beginning classes had better attitudes than others about the sport of hunting. Therefore, null hypothesis 4 was rejected.

The results showed that not all classes begun the eight hours of instruction with the same level of attitude about hunting. Possible variables such as age, geographical location, previous hunting, and other experiences may influence the attitudes of the participants prior to the beginning of the eight hours of instruction in hunter education. The fact, however, that classes differ in attitude should be of primary importance to the instructor. A pre-attitude inventory can be useful to the instructor in determining content which should be taught and emphasized. While pretesting takes time away from the teaching of the course, it can be most effective in that it helps the instructor diagnose strengths and weaknesses of the class.

Hypothesis 5. There will be no significant difference in mean attitude scores from pre-attitude to post-attitude among the participants of county classes or schools.

Table 7 shows that mean scores from pre-attitude to post-attitude for each county class or school, except one, were significantly different. Gains in scores were made primarily as a result of the hunter education course. Null hypothesis 5 was rejected.

It is obvious from the data in Table 7 that some schools or classes had higher attitude scores prior to receiving instruction than others had following instruction. All courses

Table 7. Mean Pre-attitude and Post-attitude Scores With Differences for 315 Participants in 11 County Hunter Education Classes

County Class or School (1)	Number of Participants	Mean Attitude Scores		
		Pre (2)**	Post	Difference (3)**
1	9	209.67	220.89	11.22*
2	16	188.75	206.31	17.56**
3	48	201.37	210.27	8.90**
4	35	209.71	218.65	8.94**
6	10	188.10	201.00	12.90**
7	24	207.63	215.46	7.83**
8	62	204.42	212.97	8.55**
9	30	206.83	219.03	12.20**
10	26	196.27	201.35	5.08n.s.
11	35	201.43	219.72	18.29**
12	20	206.30	221.45	15.15**

(1) County class or school #5 did not complete the attitude inventory but did complete the knowledge test.

(2) Mean pre-attitude scores among classes or schools were significantly different statistically at the .01 level by analysis of variance. $F=3.92$ $d.f._{10,304}$.

(3) Mean difference in attitude scores among county classes or schools were significantly different statistically at the .01 level by analysis of variance. $F=2.53$ $d.f._{10,304}$.

There was a significant gain in scores from pre-attitude to post-attitude for each of the classes or schools at either the .05 or .01 levels by paired t-test except for school number 10 which showed no statistically significant gain. School 1. $t=2.43$; 2. $t=5.30$; 3. $t=4.47$; 4. $t=3.82$; 6. $t=2.95$; 7. $t=2.80$; 8. $t=4.88$; 9. $t=5.26$; 10. $t=1.87$; 11. $t=7.81$; and 12. $t=4.90$.

improved the attitudes of participants, and all but one improved the attitudes of participants significantly. Is improving the attitude of participants sufficient regardless of level, or should standards be established and met such as presently being practiced in the knowledge area or cognitive domain?

Hypothesis 6. There will be no significant change in mean scores from pre-attitude to post-attitude among three age groups of participants.

Each of the age groups had significantly higher post-attitude scores than pre-attitude scores. Hypothesis 6 was rejected.

Table 8 shows that the participants 12 years old or less had the lowest pre-attitude scores (197.50) and the lowest post-attitude scores (209.67) even though the group made a gain in score of 12.17. The gain in score among age groups from pre-attitude to post-attitude was not significantly different. The positive change in attitude was similar for all three groups. The younger group came to the class with significantly lower attitude scores and departed from it with significantly lower scores than the older age groups. The group that was 22 years of age or older entered the class with significantly higher attitude scores and completed the course with significantly higher attitude scores than the two younger groups.

Maturity evidenced itself as a positive factor relative to attitude. The older participants exhibited better attitudes about the sport of hunting than the younger ones prior to and following instruction. If the results do not reflect the weakness of doing paper and pencil evaluative instruments, it can be

Table 8. Mean Pre-attitude and Post-attitude Scores With Differences for 315 Participants in Three Age Groups

Age Group (Years)	Number of Participants	Mean Attitude Scores		
		Pre (1)**	Post	Difference (2)n.s.
12 or Less	84	197.50	209.67	12.17**
13 thru 21	158	203.34	213.07	9.73**
22 or More	73	208.45	220.09	11.64**

(1) Mean pre-attitude scores among the three age groups were significantly different statistically at the .01 level by analysis of variance. $F=8.78$ $d.f._{2,312}$.

Mean pre-attitude score for age group (12 or less) was significantly lower statistically than those scores of the other two age groups at the .05 level by least significant difference.

Mean pre-attitude score for the age group (22 or more) was significantly higher statistically than those scores of the other two age groups at the .05 level by least significant difference.

(2) The mean difference in attitude scores among the three age groups was not significantly different statistically by analysis of variance. $F=0.97$ $d.f._{2,312}$.

The difference in mean scores from pre-attitude to post-attitude was statistically significant at the .01 level by paired t-test for all three age groups. For age 12 or less, $t=7.85$; age 13-21, $t=8.16$; and for ages 22 and over, $t=7.05$.

assumed that there is a positive relationship between age and attitude about hunting. Either the younger participants have not fully established values and formulated attitudes about hunting or their values and attitudes are different from those of the older participants.

Sex variable. Attitude scores with differences for males and females are recorded in Table 9. The pre-attitude scores of 203.14 and 199.94 for males and females respectively were not significantly different statistically. The increase in scores from pre-attitude to post-attitude of 10.46 and 17.29 from males and females were both statistically significant. Additionally, the 17.29 difference in the mean attitude scores for the females was significantly greater than the 10.46 difference in mean attitude scores made by the males.

The attitudes of females improved more than those of the males. This may have been caused by the interaction of sex with age or some other variable; it may be that the females were more open and willing to accept the behaviors, morals, and values of hunting and hunters as prescribed by the hunter education instructors.

License variable. Table 10 shows that 34 previously licensed participants had significantly higher pre-attitude scores (212.05) than did non-licensed participants (201.87). As in the knowledge examination, the non-licensed participants made significantly better gains in scores from pre-attitude to post-attitude (11.39) than did the previously licensed hunters combined (6.12). However, the previously licensed hunters had higher scores (218.17) than the

Table 9. Mean Pre-attitude and Post-attitude Scores With Differences for 315 Participants by Sex

Sex	Number of Participants	Mean Attitude Scores		
		Pre (1)n.s.	Post	Difference (2)*
Male	298	203.14	213.60	10.46**
Female	17	199.94	217.23	17.29**

(1) Mean pre-attitude scores between males and females were not significantly different statistically by analysis of variance. $F=0.58$ $d.f._{1,313}$.

(2) Mean difference in scores from pre-attitude to post-attitude between males and females was significantly different statistically at the .05 level by analysis of variance. $F=3.78$ $d.f._{1,313}$.

The increase in scores from pre-attitude to post-attitude for both males and females was significant at the .01 level by paired t-test. Males, $t=13.07$; females, $t=5.06$.

Table 10. Mean Pre-attitude and Post-attitude Scores With Differences for 315 Participants by Kinds of Hunting Licenses Held Previously

Previous License	Number of Participants	Mean Attitude Scores		
		Pre (1)**	Post	Difference (2)*
Juvenile & Regular	12	219.92	223.42	3.50n.s.
Juvenile Only	19	208.47	216.36	7.89n.s.
Regular Only	3	203.33	208.66	5.33n.s.
All Licenses Combined	34	212.05	218.17	6.12*
None	281	201.87	213.26	11.39**

(1) Mean pre-attitude scores among the 34 license holders were significantly different from those of the 281 non-license holders at the .01 level by analysis of variance. $F=11.51$ $d.f._{1,313}$.

(2) Mean increase in scores from pre-attitude to post-attitude was significantly higher statistically for the non-license holders than for the 34 license holders at the .05 level by analysis of variance. $F=4.25$ $d.f._{1,313}$.

Gain in scores from pre-attitude to post-attitude was statistically significant at the .05 level by paired t-test for the combined group that held a previous license and at the .01 level for the group that had no previous license. For juvenile and regular license holders, $t=0.85$; juvenile only, $t=0.70$; regular only, $t=2.42$; all licenses combined, $t=2.52$; and no previous license, $t=13.72$.

non-licensed participants (213.26). In fact, the mean pre-attitude scores of the participants with previous hunting licenses were comparable to the post-attitude scores of the participants with no previous licenses.

It appears that having previous hunting licenses promoted a positive attitude toward the sport of hunting. While the participants without previous licenses benefited most from the hunter education course, those with previously held hunting licenses benefited sufficiently to maintain the highest attitude scores at the end of the course.

Number of hunters in the home. Table 11 provides the statistical data on participants with and without hunters in the home. Statistical differences were not found among the categories of numbers of hunters in the home. The pre-attitude scores were similar for all groups.

Differences in the pre-attitude/post-attitude scores among the five categories were not significantly different statistically. For each category, the gain in score from pre-attitude to post-attitude was statistically significant. Those participants with one or more hunters in the home did not have a "change of attitude" advantage over those having no hunters in the home. Participants having no hunters in the home made higher mean post-attitude scores than any of the categories with hunters in the home.

Magazines received in the home. As shown in Table 12, receiving wildlife magazines in the home did not have a significant influence on the participants' mean pre-attitude scores. Likewise, receiving wildlife magazines in the home did not have a

Table 11. Mean Pre-attitude and Post-attitude Scores With Differences for 315 Participants by the Number of Hunters in the Home

Number of Hunters in the Home	Number of Participants	Mean Attitude Scores		
		Pre (1)n.s.	Post	Difference (2)n.s.
0	91	203.81	216.18	12.37**
1	139	202.15	213.64	11.49**
2	77	204.56	211.69	7.13**
3	5	198.20	214.40	16.20*
4	3	182.33	201.33	19.00*

(1) Statistically significant differences were not found among the pre-attitude scores by analysis of variance. $F=1.55$ $d.f._{4,310}$.

(2) Statistically significant differences were not found in gain in scores among the four categories by analysis of variance. $F=2.12$ $d.f._{4.310}$.

Gain in scores from pre-attitude to post-attitude was statistically significant for each category by paired t-test. Gains by participants with none, one, or two hunters in the home were at the .01 level; gains by participants with three or four hunters in the home were at the .05 level. With no hunters in the home, $t=8.41$; one hunter, $t=9.57$; two hunters, $t=4.46$; three hunters, $t=2.57$; and four hunters, $t=2.35$.

Table 12. Mean Pre-attitude and Post-attitude Scores With Differences for 315 Participants by the Number of Wildlife Magazines Received in the Home

Magazines in Home	Number of Participants	Mean Attitude Scores		
		Pre (1)n.s.	Post	Difference (2)n.s.
0	136	199.85	211.25	11.40**
1	82	204.83	216.20	11.37**
2	43	207.19	215.89	8.70**
3	29	204.45	219.17	14.72**
4	25	204.84	209.92	5.08n.s.

(1) Mean pre-attitude scores among categories were not significantly different statistically in terms of number of magazines received in the home. $F=2.26$ $d.f._{4,310}$.

(2) Mean difference in scores among categories from pre- to post-attitude were not significantly different statistically in terms of magazines received in the home. $F=1.93$ $d.f._{4,310}$.

Mean gain from pre-attitude to post-attitude was statistically significant at the .01 level by paired t-test for each category except the one receiving four magazines in the home. That difference was not statistically significant. For participants who received no magazines in the home, $t=9.42$; one magazine, $t=7.33$; two magazines, $t=5.37$; three magazines, $t=5.43$; and 4 magazines, $t=1.80$.

significant influence on participants' mean gain in scores from pre-attitude to post-attitude. The receiving of wildlife magazines in the home had no influences on attitude of participants in the hunter education program.

Correlation of Knowledge and Attitude Scores

Hypothesis 7. There will be no significant correlation between mean pretest knowledge scores and mean pre-attitude scores.

Table 13 shows a correlation coefficient of .52 between the two scores. The correlation coefficient was statistically significant at the .01 level. The two pretests have 27 percent of their variance in common. One can be reasonable confident that a true relationship existed between the two variables. With correlations around .50, crude group predictions may be achieved.

Since there was a significant correlation between pretest knowledge scores and pre-attitude scores, null hypothesis 7 was rejected.

Hypothesis 8. There will be no significant correlation between mean post-test knowledge scores and mean post-attitude scores.

Table 13 shows a correlation of .48 between the two scores. The correlation coefficient was statistically significant at the .01 level.

There was a significant correlation bwtween mean post-test knowledge scores and mean post-attitude scores. Null hypothesis 8 was rejected.

Table 13. Correlational Data Between Knowledge and Attitude Scores for Pretests, Post-tests, and Differences Between Pretests and Post-tests

Tests	Number of Participants	Correlation Coefficients	Statistical Significance
Pre-Knowledge X Pre-Attitude	297	.52	.01
Post-Knowledge X Post-Attitude	299	.48	.01
Diff. Knowledge X Diff. Attitude	297	.05	n.s.

Notes: When a correlation coefficient is statistically significant, one can be reasonably confident that a true relationship exists between the variables.

The pretests with a correlation coefficient of .52 have 27 percent of their variance in common; the post-tests with a correlation coefficient of .48 have 23 percent of their variance in common.

In addition to statistical significance, correlation coefficients have a meaning for prediction. With correlations around .50, crude group predictions may be achieved.

Hypothesis 9. There will be no significant correlation between change in knowledge scores from pretest to post-test and change in attitude from pre-attitude to post-attitude scores.

Table 13 shows a correlation of .05 between the two change scores. Since the correlation coefficient was not statistically significant, hypothesis 9 was not rejected. There was no significant correlation between change in knowledge scores from pretest to post-test and change in attitude from pre-attitude to post-attitude scores.

Summary. It can be assumed from the study that if participants make good knowledge scores they will make good attitude scores and vice versa. It can also be assumed that if they make poor knowledge scores they will make poor attitude scores and vice versa. Knowledge and attitude about the sport of hunting are interrelated. It is difficult, if not impossible, to teach the cognitive aspects of hunter education without teaching the affective aspects. It is the matter of emphasis which needs to be addressed.

Reasons for Hunting

Prior to hunter education instruction, participants were requested to respond to the question, "Why does hunting appeal to you?" (See Hunter Education Research Questionnaire in Appendix C). They were asked to rank the four reasons given which were "I enjoy the out-of-doors," "To add to the food supply," "My best friends hunt," and "It is an exciting sport." In addition,

participants were prompted to write other reasons to the open-ended question in the spaces provided.

Table 14 shows the weightings and ranking of the four suggested reasons why hunting appealed to the 401 participants who were entering the hunter education classes. The number one reason given for hunting was that the sport offered an opportunity to "enjoy the out-of-doors." Secondly, it was viewed as "an exciting sport." The rankings provided by the twelve counties or classes were rather consistent throughout.

A sample of other reasons, listed somewhat by category, were offered by respondents as follows:

Dad likes to hunt	I like shooting
To accompany son	I like guns
So my dad and I can hunt	Enjoy guns and shooting
My husband hunts	I collect guns
Family hunts	
I like to hunt with my dad	It takes skill
Cousin and uncle hunt	Takes skill and coordination
Will be with my husband	I enjoy the challenge

The sport of hunting was seen as an activity which fostered a closer relationship between and among immediate members of families. Others viewed hunting as an additional function through which they could enjoy their firearms and shooting which requires skill and presents a challenge.

Table 14. Weighting and Ranking of Four Suggested Reasons Why Hunting Appealed to 401 Participants Who Were Entering the Hunter Education Classes

Suggested Reasons	Participants' Weighting (1-4)	Ranking of Reasons
Enjoy Out-of-doors	1.58	1 st
Add to Food Supply	3.11	3 rd
Best Friends Hunt	3.39	4 th
It is an Exciting Sport	1.97	2 nd

FINDINGS

The findings of the study were structured around the categories of demography, knowledge about hunting, attitudes about hunting, and correlations between knowledge and attitude scores. The findings relate to such variables as classes, age of participants, sex of participants, hunting licenses, hunters in the home, and magazines received in the home.

Demographic

1. Approximately 1/2 of the participants who completed the hunter education courses were between thirteen and twenty-one years of age. About 1/4 of the participants were twelve years of age or less and the remaining 1/4 were twenty-two years of age or older.
2. Of those who completed the hunter education courses, 94 percent were males.
3. Most (80%) of the participants who completed the hunter education courses held no previous hunting license. The remainder held juvenile licenses, regular hunting licenses or both.
4. Seventy-two percent of the participants who completed the hunter education courses reported one or more hunters in the home.
5. Of those who completed the hunter education courses, 43 percent did not receive a wildlife magazine in the home.

Knowledge About Hunting

6. There was a significant difference in pretest knowledge scores among the classes. Prior to instruction some classes were more knowledgeable about hunting than others.
   --There was a significant difference in the amount of knowledge gained from pretest to post-test among the classes. Some classes gained more knowledge than others as a result of instruction in hunter education.
   --All classes were significantly more knowledgeable about hunting after receiving instruction than before receiving instruction.
7. There was a significant difference in pretest knowledge scores among the three age groups. Prior to receiving instruction, participants 22 years of age and over were more knowledgeable about hunting than those 13 to 21 years of age; participants 13 to 21 years of age were more knowledgeable about hunting than those 12 years of age or less.
   --There was no significant difference in the amount of knowledge gained from pretest to post-test among the three age groups. All three age groups were significantly more knowledgeable about hunting after receiving instruction than before.
8. There was no significant difference in pretest knowledge scores between males and females. Likewise, there was no significant difference in the amount of knowledge gained from pretest to post-test between the sexes. Both sexes

were significantly more knowledgeable after instruction than before instruction.

9. Participants with previous hunting licenses made significantly higher pretest scores than those with no previous hunting license. However, participants with no previous hunting licenses gained more knowledge about hunting than those with previous hunting license as a result of instruction.

--Participants who held regular hunting licenses previously did not make significant gains in knowledge as a result of the instruction; all other groups did.

10. The number of hunters in the home did not influence significantly the pretest scores of participants. Likewise, the number of hunters in the home did not affect significantly the gain in score from pretest to post-test among categories. Whether or not there were hunters in the home, the participants improved their knowledge about hunting significantly as a result of the hunter education course.

11. The number of wildlife magazines received in the home did not influence significantly the pretest scores of participants. Likewise, the number of magazines received in the home did not affect significantly the gain in scores from pretest to post-test among categories. Whether or not there were wildlife magazines received in the home, the participants improved their knowledge of hunting significantly as a result of the course.

Attitudes About Hunting

12. There was a significant difference in pre-attitude scores among the classes. Prior to instruction some classes had better attitudes than others about hunting.

--There was a significant positive difference from pre-attitude to post-attitude scores among classes. The attitudes of some classes were changed more than they were for other classes as a result of instruction in hunter education.

--All but one of the classes had significantly better attitudes about hunting after receiving instruction than before receiving instruction.

13. There was a significant difference among the three age groups in pre-attitude scores. Prior to receiving instruction, participants 22 years of age and over had better attitudes about hunting than those 13 to 21 years of age; participants 13 to 21 years of age had better attitudes about hunting than those 12 years of age or less.

--There was no significant difference among the three age groups in change of attitude from pre-attitude to post-attitude scores. All three age groups had significantly better attitudes about hunting after receiving instruction than before.

14. There was no significant difference in pre-attitude scores between males and females. Both sexes had significantly better attitudes after instruction than before instruction.

However, the gain in attitude scores as a result of instruction by females was significantly greater than it was for males.

15. Participants with previous hunting licenses made significantly higher pre-attitude scores than those with no previous hunting license. Both groups had better attitudes about hunting after instruction than before instruction. However, participants with no previous hunting licenses changed attitudes much more positively than those with previous hunting licenses.
16. The number of hunters in the home did not influence the pre-attitude scores of participants nor did it affect their change in attitudes during the time of the hunter education course. Whether or not there were hunters in the home, the participants improved their attitudes about hunting as a result of the hunter education course.
17. The number of wildlife magazines received in the home did not influence the pre-attitude scores of participants nor did it affect their change in attitude during the time the hunter education course was offered. Whether or not there were wildlife magazines received in the home, the participants improved their attitudes about hunting as a result of the hunter education course.

Correlation of Knowledge and Attitude Scores

18. There was a significant relationship between the pretest knowledge scores and the pre-attitude scores. Likewise,

there was a significant relationship between the post-test knowledge scores and the post-attitude scores. Knowledge and attitude of participants about the sport of hunting were interrelated.

Reasons for Hunting

19. The reason listed on the questionnaire which appealed most to the aspiring hunters about the sport was that it offered an opportunity to enjoy the out-of-doors. To many it was seen as an activity which fostered a closer family relationship. Some viewed hunting as an additional way to enjoy their gun collection and meet the challenge of expert shooting.

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APPENDIX A

TEST BOOKLET NO._____

NEW JERSEY HUNTER EDUCATION EXAMINATION
NUMBER 4

Directions: There are 25 multiple choice questions in this part of the examination. One of the choices listed will best answer the question or complete the statement. Blacken the letter on the answer sheet which you think is best for each question. Do not write on this test booklet. (Example A B ● D when C is the best answer).

1. A gun should be given a thorough cleaning when
   A. it has been exposed to mud, sand, rain or snow.
   B. moisture has had an opportunity to form in metal parts.
   C. it has been stored uncovered for a long time.
   D. all of the above conditions occur.

2. The rifle position with the least amount of support is the
   A. prone position.
   B. sitting position.
   C. kneeling position.
   D. standing position.

3. The basic parts of a rifle cartridge are powder charge, bullet, case and
   A. shell.
   B. slug.
   C. primer.
   D. wad.

4. How should a firearm be handled when crossing a fence while alone?
   A. Place the firearm under the fence, then climb over and pick up the firearm.
   B. Unload and place the gun on the other side of the fence; then reload after you crossed the fence.
   C. Stand the gun up firmly against the post, then carefully reach through and get it after crossing the fence.
   D. Hold the gun in one hand with the safety on; then climb over the fence.

5. Over half of the land in North America is owned by
   A. private landowners.
   B. Indian reservations.
   C. the public (government)
   D. industrial corporations.

6. The main difference between a shotgun and rifle is that
   A. a rifle is more dangerous because the bullet travels farther.
   B. a shotgun usually has two barrels instead of one.
   C. a shotgun has a smooth barrel; a rifle does not.
   D. a shotgun barrel has a ventilated rib.

7. Which gun carry should never be used when another hunter is walking behind you?
   A. Sling.
   B. Slide.
   C. Trail.
   D. Shoulder.

8. The "action" of a firearm refers to
   A. the important parts which load, fire, and eject the used case.
   B. the bullet energy measured in foot pounds.
   C. the recoil when it is fired.
   D. the ignition which takes place in the cartridge or shell upon firing.

9. Why should every hunter be a good shot?
   A. To kill more game with less shots.
   B. To save ammunition.
   C. For safety and clean kills.
   D. So he/she can hunt near buildings safely.

10. You have been hunting all day and suddenly you don't know for sure where you are. What would be the <u>first</u> thing to do?
   A. Yell till someone hears you and answers.
   B. Walk in the direction you think you came from.
   C. Fire several shots into the air immediately.
   D. Admit to yourself you are lost and stop.

11. A friend refuses to follow the rules for proper gun safety when you are hunting together. What do you do?
   A. Have the gun taken away.
   B. Tell your friend you won't hunt unless the proper rules are followed.
   C. Go home without your friend.
   D. None of the above.

12. It is important for a hunter to understand and appreciate that hunting
   A. is a priviledge.
   B. has rules like other sports.
   C. helps conservation.
   D. involves all of the above.

13. Hunters today view game animals as
    A. good targets for practice shooting.
    B. a nuisance.
    C. natural resources of the environment,
    D. all of the above.

14. You want to store your firearms and ammunition. Which of the following methods is most correct?
    A. Firearms may be stored in a wall rack.
    B. Ammunition and unloaded firearms should be stored separately in locked compartments.
    C. Ammunition and unloaded firearms may be stored together in one secure place if locked.
    D. Firearms may be stored loaded in a closet as long as the closet is locked.

15. The number of shots, whistles or signals for help is
    A. two.
    B. three.
    C. four.
    D. five.

16. Bad hunter conduct usually stems from
    A. greed and lack of responsibility.
    B. lack of knowledge and understanding.
    C. being young and not wise.
    D. not having enough hunting experience.

17. The gun carry which gives the best control of the gun and muzzle is the
    A. cradle carry.
    B. two-handed carry.
    C. side carry.
    D. shoulder carry.

18. A deer disappears into a clump of bushes and you think you can still see it. What do you do?
    A. Shoot at the point where you think it would be.
    B. Fire a shot in the air to make it move into the open.
    C. Wait for positive identification and a clear shot before firing.
    D. Run towards the bushes and be ready to fire.

19. Sportsmanship is conduct becoming to one who enjoys field sports. Which one of the following statements does not describe sportsmanlike conduct? It
    A. involves fair play and honest rivalry.
    B. means courteous relations and graceful acceptance of results.
    C. is showmanship of hunting equipment and clothing.
    D. includes respect for all other people's rights and interests.

20. The hunter must accept the responsibility for knowing which of these things about a gun?
    A. How it works.
    B. Where it's pointing.
    C. Where the bullet will stop.
    D. All of the above things.

21. There are many reasons why people like to hunt. From the choices below, pick the major reason. To
    A. get away from the job or school.
    B. be out-of-doors and enjoy nature.
    C. kill animals for the sake of killing something.
    D. enjoy the taste of wild game meat.

22. Ethics are principles or disiplines which we use and react to daily. Ethics deals with
    A. the kind of temper one possesses.
    B. what is good and what is bad.
    C. an unuaual ability to stalk game.
    D. sharing secrets about game with others.

23. A farmer gave you permission to hunt on his land. Being a courteous hunter, you leave
    A. after thanking him for letting you hunt on his land and offering him part of your bag.
    B. early without thanking him since he may be busy.
    C. after a reasonable time without bothering him.
    D. and write him a thank you note when you get home.

24. Which is not a commandment of shooting safety?
    A. Always clean and oil the gun before shooting it.
    B. Treat every gun with the respect due a loaded gun.
    C. Be sure of target before you pull the trigger.
    D. Never point a gun at anything you do not want to shoot.

25. A right start and proper beginning will, hopefully, bring you many years of satisfaction and pleasure as a hunter. Your future in hunting will depend primarily upon
    A. you and your attitude about hunting
    B. the National Rifle Association
    C. your Hunter Education Instructor
    D. other hunters and game protectors

Directions: The following 15 statements are either true or false. Blacken the T or F on the answer sheet to indicate your response to each statement. Do not write on this test booklet. (Example T F when true is the best answer).

26. Before firing a shotgun, the stock is brought to the shoulder.

27. When handling guns, the muzzle should always be pointed in a safe direction.

28. "Zones of fire" means deciding which areas you and your friends may shoot in safely.

29. Hunting began as a way of surviving.

30. When shooting a shotgun at a moving target, the trigger is squeezed slowly.

31. In most cases, courtesy and sportsmanship are related to safety.

32. Today every state has an agency for the protection and management of wildlife.

33. Most game species in North America are over-harvested by hunters.

34. Ethics means our own set of rules for our own conduct.

35. You should treat all guns as if they were loaded.

36. Hunters contribute to the welfare of non-hunted species of animals.

37. Firing slugs through the barrel of a shotgun will damage it.

38. As long as a shell or a cartridge feels snug in the chamber, it can be fired from the gun.

39. You may hunt on posted land only if permission has been given to you by the landowner.

40. Hunters restore wildlife habitat.

This is the end of the examination. Return both the test booklet and answer sheet to your instructor.

This examination was based on the NRA Hunter Safety and Conservation Program Student Examination No. 3.

For Official Use Only

Test Score_____

Pass_____Fail_____

ANSWER SHEET

NEW JERSEY HUNTER EDUCATION EXAMINATION
NUMBER 4

Name_____ Age_____

Signature_____ County_____

Street Address_____ State_____

City_____ Date_____

Directions: For each question or statement in the test booklet, blacken the best answer on this answer sheet. Be careful to mark answers at the appropriate space. Erase cleanly if you decide to change an answer. (Example A B ● D)

1.	A B C D	16.	A B C D	26.	T F
2.	A B C D	17.	A B C D	27.	T F
3.	A B C D	18.	A B C D	28.	T F
4.	A B C D	19.	A B C D	29.	T F
5.	A B C D	20.	A B C D	30.	T F
6.	A B C D	21.	A B C D	31.	T F
7.	A B C D	22.	A B C D	32.	T F
8.	A B C D	23.	A B C D	33.	T F
9.	A B C D	24.	A B C D	34.	T F
10.	A B C D	25.	A B C D	35.	T F
11.	A B C D			36.	T F
12.	A B C D			37.	T F
13.	A B C D			38.	T F
14.	A B C D			39.	T F
15.	A B C D			40.	T F

Please make sure you answered all questions and provided the information requested above before returning both the test booklet and this answer sheet to your instructor.

APPENDIX B

PENNSYLVANIA GAME COMMISSION
HUNTER SAFETY PROGRAM

ATTITUDE INVENTORY FOR HUNTERS

HUNTER SAFETY EDUCATION

Teaching Firearm Safety Education

AS A part of the firearm and hunter safety study (Bulletin No. 711) made by Dr. Frank Anthony, Associate Professor of Agricultural Education, The Pennsylvania State University, an Attitude Inventory was developed for comparison of methods of teaching firearm safety education in selected Pennsylvania schools.

Used as a yardstick to measure the effectiveness of teaching methods in hunter safety education, the Attitude Inventory has proven useful to teachers and hunter safety instructors to determine the attitude each student accepts in the safe handling of firearms.

In constructing the Attitude Inventory for firearm and hunting safety education, four or five situations for each of the "Ten Commandments of Shooting Safety" were chosen and formulated into a test of personal adjustment and emotional concepts. The items on the test comprised reactions to proper use of firearms, respect for fellow hunters, and respect for property rights and game laws.

An Attitude Inventory of 60 items was validated by 50 Game Protectors who acted as judges to evaluate each item. From this procedure 50 items were selected and tested further by giving the test to students in two schools similar to the schools selected for the study. After a few changes the test was printed with the title, "An Attitude Inventory for Beginning Hunters."

To measure the effectiveness of students taking hunter safety training, or the inexperienced gun handler, the Attitude Inventory was given before and after being taught by an assigned method of firearm safety education. An attitude of agree or disagree was determined as a correct answer to safe gun handling.

THE SPORT of target shooting is often a happy biproduct of hunter safety training.

The experienced hunter or gun handler's attitude should be stronger in agreeing or disagreeing with the safe or unsafe questions on Dr. Anthony's Attitude Inventory for hunters.

Check your opinion on the following 50 questions on gun handling which is being used in Pennsylvania's Hunter Safety Program.

PENNSYLVANIA GAME COMMISSION
HUNTER SAFETY PROGRAM

ATTITUDE INVENTORY FOR HUNTERS

By Dr. Frank Anthony

THE PENNSYLVANIA STATE UNIVERSITY
THE DEPARTMENT OF AGRICULTURAL EDUCATION
THE PENNSYLVANIA GAME COMMISSION

1. Name ..... Age .....

2. Have you had firearms or hunting education? .....

No. of hours ..... (Check) By game official .....

Brother ....., Dad ....., Hunter Safety Instructor .....

Directions:

Place an X over the letters which most accurately indicate your opinion of each statement. SA—Strongly Agree, A—Agree, U—Undecided, D—Disagree, SD—Strongly Disagree. Read each statement carefully, and yet do not spend too much time with any statement before checking each one.

SA A U D SD	1. You should observe the same safety precautions for an unloaded antique collector's gun as for your hunting rifle.
SA A U D SD	2. It is safe to leave a gun within the reach of small children if the gun is not loaded.
SA A U D SD	3. A loaded gun leaning against a tree can't be fired by a cat or dog.
SA A U D SD	4. While you are hunting, the gun should remain on safe until you can clearly see what you intend to shoot.
SA A U D SD	5. When three men are hunting side by side, rifles should always be pointed to the left.
SA A U D SD	6. The use of the safety on a repeating or autoloading firearm is as important after firing as it is before firing.
SA A U D SD	7. The safety on the gun is a positive way of preventing the gun from being fired.
SA A U D SD	8. A person who is careful about where he points his gun is a person who accepts responsibility.
SA A U D SD	9. Every gun should be handled at all times as if it were loaded and ready to fire.
SA A U D SD	10. The most important reason why we don't want loaded guns in houses or camps is because there is nothing to shoot at in a house or camp.
SA A U D SD	11. Snow is not as dangerous as dirt when it plugs the barrel of a gun.
SA A U D SD	12. Shooting a gun when the barrel is partly plugged with dirt is as dangerous as shooting a gun when the barrel is completely plugged with dirt.
SA A U D SD	13. A hunter must be quick and the best hunters shoot quickly when they see something moving in the woods.

SA A U D SD 14. Never aim or point your gun until you are definitely sure of your target.

SA A U D SD 15. Every hunter should have the experience of shooting at a moving target before he goes on an actual hunt.

SA A U D SD 16. An expert hunter is usually the first one to fire when game is sighted.

SA A U D SD 17. Every hunter should visit a game reserve or other places where game lives before going hunting so that he knows what the game looks like in its natural surroundings.

SA A U D SD 18. A rabbit slung over a boy's shoulder may look like a deer to another hunter.

SA A U D SD 19. A white handkerchief may look like a deer's tail in the distance.

SA A U D SD 20. It is not safe to shoot across roads even if they are old country roads.

SA A U D SD 21. It is unlawful to shoot at wild animals or birds within 150 yards of occupied buildings without advance permission.

SA A U D SD 22. The best rule of gun safety is never point a gun at anything you do not intend to shoot.

SA A U D SD 23. When stumbling or falling, a safe hunter holds onto his gun.

SA A U D SD 24. It is safe to cross a wooden fence with a loaded rifle.

SA A U D SD 25. The most important thing to do when getting into a boat is to make sure the safety is on when your gun is loaded.

SA A U D SD 26. Glass objects are dangerous targets.

SA A U D SD 27. It is safe to shoot at an object on a pond if the pond is deep.

SA A U D SD 28. A rocky steep hill makes a good target area.

SA A U D SD 29. Ammunition and firearms should be stored in separate places.

SA A U D SD 30. Storage places for guns should be locked up as well as the storage places for ammunition.

SA A U D SD 31. Responsible hunters would approve of drinking a small amount of beer or whiskey while hunting during cold weather.

SA A U D SD 32. Guns should always be "sighted in" immediately after you reach your hunting area.

SA A U D SD 33. In order to travel light, a good hunter takes only his gun and ammunition.

SA A U D SD 34. It is embarrassing for a good hunter to come home without any game.

SA A U D SD 35. The hunter's age is the most important factor to consider when issuing hunting licenses.

SA A U D SD 36. The opportunity to hunt is a privilege.

SA A U D SD 37. Courses on safe hunting are needed only for people who were raised in homes where the parents did not hunt.

SA A U D SD 38. The most common cause of hunting accidents is poor quality guns.

SA A U D SD 39. You may point your rifle at anything if you are alone in a large woods.

SA A U D SD	40. It is OK to shoot near buildings if you are sure that no one is at home.
SA A U D SD	41. An accident is more likely to occur when safety rules are not followed.
SA A U D SD	42. When three men are hunting together, they should know the location of their partners at all times.
SA A U D SD	43. A person with considerable patience is usually a safer hunter than a quick-tempered or impatient one.
SA A U D SD	44. Good hunters get more game with less ammunition than poor hunters would use.
SA A U D SD	45. Some game laws have been passed chiefly because of the poor practices used by a few hunters.
SA A U D SD	46. Game laws are made to protect hunters as well as wildlife.
SA A U D SD	47. Some game laws are made to protect farmers and landowners.
SA A U D SD	48. Some game laws are made purposely to get money from fines for use in improving hunting areas.
SA A U D SD	49. A sportsman should get the farmer's permission to hunt even if the land is not posted.
SA A U D SD	50. A person greedy for game is not a safe hunter.

Answers to Hunter Attitude Inventory

1. SA	14. SA	27. SD	39. SD
2. SD	15. SA	28. SD	40. SD
3. SD	16. SD	29. SA	41. SA
4. SA	17. SA	30. SA	42. SA
5. SD	18. SA	31. SD	43. SA
6. SA	19. SA	32. SD	44. SA
7. SD	20. SA	33. SD	45. SA
8. SA	21. SA	34. SD	46. SA
9. SA	22. SA	35. SD	47. SA
10. SD	23. SA	36. SA	48. SD
11. SD	24. SD	37. SD	49. SA
12. SA	25. SD	38. SD	50. SA
13. SD	26. SA		

APPENDIX C

HUNTER EDUCATION RESEARCH QUESTIONNAIRE

1. Name....._____

2. Age....._____

3. Sex.....Male ( ) Female ( )

4. Did you have a juvenile license?.....No ( ) Yes ( )

5. Did you ever have a hunting license in this or any other state?.....No ( ) Yes ( )

6. How many kinds of wildlife magazines do you get in your home?.....( )

7. Check off those that hunt in your ome.....Dad ( ) Mom ( )
   Brother ( ) Sister ( )
   Wife ( ) Son ( )
   Specify Others_____

8. Why does hunting appeal to you?

   (Rank the reasons)
   (1, 2, 3, 4, etc.)

   _____ I enjoy the out-of-doors
   _____ To add to the food supply
   _____ My best friends hunt
   _____ It is an exciting sport
   _____ _____
   _____ _____